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OSEI Corporation Summary

US Department of Interior Study on the Characteristics, Behavior, & Response Effectiveness of Spilled Dielectric Insulating Oil in the Marine Environment

The US department of Interior, through solicitation number M08PS00094, award number: M09PC002, through their Bureau of Ocean Energy Management and Enforcement (BOEMRE), (previously Mineral Management Service) paid for a study of dielectric oil's ability to be dispersed, skimmed and bio remediated.

Information specifically related to the product called OSE II begins on page 12. It states:

“Bioremediation Study

This bioremediation effectiveness testing protocol (CFR, 1999) was designed to determine oil's ability to naturally biodegrade by quantifying changes in the oil composition resulting from biodegradation.

An EPA National Contingency Plan (NCP) approved product, Oil Spill Eater II (Oil Spill Eater International, Corp.), was include in the experimental design.

Bioremediation testing on Oil Spill Eater II (OSE II) has proven it to be effective at degrading highly-saturated crude oils in the laboratory. The following test flasks (labeled with unique identifiers) were prepared and set up on an orbital shaker at day 0 to reflect the following treatment:

Table 3. Bioremediation Study Sampling and Analysis Matrix

Treatment	No. of samples at sampling times	Total No. of analytical determinations				
Day 0	Day 7	Day 28	Microbial Counts	GC/MS	Gravimetric	
Control	3	3	3	9	9	9
Nutrient	3	3	3	9	9	9
Product*	3	3	3	9	9	9

*A NCP approved product, OSE II

A detailed description of the test procedure can be found in the Code of Federal Register Title 40, Chapter 1 Part 300”.

Despite some problems in the way the study was carried out, the study shows OSE II is very effective at remediating the dielectric oil. For some reason unneeded nutrients were added in to the process, contrary to the manufacturer's directions for application. These unnecessary, added nutrients increased the toxicity of the test flasks, which in turn slowed down the degradation rate of the oil and limiting the true results to be expected based on numerous other test in which the protocols laid out by the manufacturer were more closely followed. Nonetheless, the study still showed OSE II to be absolutely effective at rapidly degrading the dielectric oil.

Also contrary to the manufacturer's instructions, the administrators of the test also added non-indigenous bacteria after the test was started. This also caused a slow down in degradation and prevented OSE II from showing the expected 100% degradation rate of the dielectric oil in 28 days. By introducing non-indigenous bacteria into the application after the test process was started, a competition between the OSE II-enhanced natural indigenous bacteria, and the foreign, non indigenous bacteria was created. While these bacteria are competing, they are killing each other off in the fight for the food source: the oil. This lessened the amount of oil remediated at the end of the experiment, since some of the indigenous microbes' time is spent fighting other bacteria for the food source rather than just being able to focus on digesting the oil to CO₂ and water.

The test, however, proved, once again, how effective OSE II is at remediating oil - even dielectric oil. The results showed over a 67% reduction in the oil in 28 days. The reduction was exponential if you account for the slowdown due to the added bacteria, (see the difference in remediation from day 0 to day 7, and from day 7 to day 28). So even with the adversities the product had to overcome which were caused by the test administrators, it is easy to understand that OSE II would have only needed a few days more for 100% bio remediation of the oil to occur, resulting in a complete conversion of the oil to CO₂ and water.

This study also tested dispersants and mechanical skimming of the oil as well. The dispersants, Exxon's Corexit 9500 and 9527A, respectively showed poor results as the water temperature decreased. It is important to note that dispersants do not clean up oil; they disperse oil broadly into the water column. This spreads the toxic impact of the oil into the area of the water where 60% of the marine species live, adversely effecting these species' ability to survive.

The Deepwater Horizon Gulf of Mexico spill also proved that both Corexits eventually sink oil to the seabed, increasing the spill's impact to an additional area, killing these species and destroying their habitats. Then the Gulf spill proved that the sunken/dispersed oil then migrates to the shoreline, impacting yet another area, where the same oil has to be addressed a second time. The use of these toxic

dispersants causes absolutely needless destruction of natural resources and species. Both Corexits were also found to be very toxic and deleterious by themselves to marine and wildlife species as well as to seabed, water column and shoreline flora and fauna. A recent study by Woods Hole Oceanographic Institute also discovered that both Corexits prevent oil from degrading, which means these dispersants are going to increase the length of time that the oil's toxicity effects the environment.

This Department of Interior study was performed due to the fact that a spill could impact the Nantucket Sound, Cape Cod, and Martha's Vinyard area in the US. The EPA/RRT, federal, state, local governments, and residents now have a choice between 1) mechanical skimming, that will only remove somewhere between 2 to 8% of the oil; 2) dispersants that increase rather than decrease the oil's toxicity and spread it to several additional areas, killing species, and destroying natural resources, only to have to address the same oil once again, once it comes ashore; or 3) OSE II, the product who's successful testing since 1989, and once again with this study, shows OSE II dramatically limits the impact of the spill, does not harm species, and converts 100% of the oil to CO₂ and water, eliminating any additional steps, while protecting the environment. OSE II is far more economical than mechanical skimming, adsorbents, or dispersants. OSE II is far less expensive, safer, and more effective at rapidly cleaning up 100% of a spill.

This test, along with the large number of tests already carried out on OSE II since 1989, proves, once again, OSE II is very effective at remediating oil and converting oil to CO₂ and water. This Department of Interior test, through BOEMRE, now proves there is only one way to effectively clean up 100% of a spill, preventing secondary impacts of the spill, and remediating the entire spill to safe, non-toxic CO₂ and water. Of the eight bio remediation products tested at LSU by the US EPA and BP, OSE II was the only product which effectively remediated the most toxic part of the oil – the PAHs without any additions. The Department of Interior chose only one bio remediation product from that group of eight to do further tests on. That product was OSE II, thus, proving that OSE II was the best product tested for the Deepwater Horizon oil blowout.

The Department of Interior now has a product that they can add to a drilling rigs for emergency response, to safely and effectively convert oil to CO₂ and water, OSE II is the non toxic alternative with a tested substantiated end point.